Racine Street Bridge (Hazelwood Bridge) Spanning the Rock River Jefferson Jefferson County Wisconsin HAER No. WI-101 HAER
WIS
28-JEFF,

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

Historic American Engineering Record National Park Service Department of the Interior Denver, Colorado 80225-0287

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HISTORIC AMERICAN ENGINEERING RECORD RACINE STREET BRIDGE (Hazelwood Bridge) HAER No. WI-101

Location:

The bridge is located in the city of Jefferson, Jefferson County, Wisconsin, and carries U.S. Highway 18, known as Racine Street in Jefferson, across the Rock River. Oriented on an east-west axis, the bridge connects the downtown commercial district on the east bank with a residential and commercial neighborhood on the west.

Ouad:

Jefferson, Wis.

UTM:

16:4726795:352460 16:4726785:352660

Date of Construction:

1935-36 (taken from the bridge plate)

Present Owner:

Wisconsin Department of Transportation, Madison, Wisconsin

Present Use:

Vehicular and pedestrian bridge. Scheduled to be replaced in 1997.

Significance:

The Racine Street Bridge is an 11-span deck truss bridge built by the Milwaukee Bridge Company from Wisconsin State Highway Commission plans. With three Warren deck truss spans that equal more than half the bridge's total length, the Racine Street Bridge was locally dubbed the "Super-Bridge" because of its size. Only 14 deck truss bridges are extant in the state, and the deck truss bridge has been classified as a rare type. The Racine Street Bridge is one of southern Wisconsin's three remaining deck truss bridges. A previously completed Determination of Eligibility completed in 1994 concluded that the Racine Street Bridge is eligible for the National Register of Historic Places under Criterion C in the area of engineering.

Historian:

Kirk R. Huffaker, Mead & Hunt, Inc., Madison, Wisconsin, January 1997.

I. ENGINEERING DESCRIPTION

Built in 1935-36, the Racine Street Bridge is composed of 11 spans that measure 706 feet 1.5 inches in total length. The bridge has an overall width of 41 feet, a 30-foot roadway width and flanking 5-foot 6-inch-wide sidewalks. The bridge, with an east-west orientation, spans the width of the Rock River, a track of the Chicago & Northwestern Railroad, and an alley near the river (Figure 1).

The three center spans, Nos. 4, 5, and 6, are composed of Warren deck trusses. The center span, No. 5, is 122 feet in length while the two flanking spans, Nos. 4 and 6, are 121 feet in length. Each span is composed of 10 panels that are 12 feet wide and 18 feet high. These spans are carried by 21-inch I-beam floor beams and 12-inch I-beam stringers, supported by a system of two outer and one center truss. The top and bottom chords are composed of 12-inch channels with lacing and tie plates at the ends. Vertical members of the Warren truss are rolled I-beams that measure 10 x 8 inches. Diagonal members are rolled I-beams that measure 10 x 8 inches. The distance between the two outer trusses is 32 feet, with the center of the roadway supported by the center truss. All major joint connections are riveted.

The two sets of sway bracing between the trusses are 16 feet wide and composed of back-to-back 2.5-inch x 3-inch angles. There are also two sets of lateral bracing between the trusses. This bracing is also 16 feet wide, to match the width of the sway bracing, and 12 feet in length, to match the width of each panel of the truss. The number of panels of lateral bracing, 30, is equal to the number of panels of the truss system. The bracing is made up of single 2.5-inch x 3-inch angle-bottom laterals and back-to-back 3.5-inch x 5-inch angle struts (Figure 2).

There are eight deck girder approach spans; three spans on the west, Nos. 1-3, and five spans on the east, Nos. 8-11. The west approach spans are a total of 127 feet 9.5 inches in length with spans that measure 42 feet 5 inches, 42 feet 4.5 inches, and 43 feet individually. The length of the four east approach spans total 171 feet 11.5 inches and are 38 feet 10 inches, two spans at 44 feet 4.5 inches, 44 feet 4 inches, and 44 feet 5 inches individually. Eight rolled I-beam stringers carry the concrete traffic deck and are supported by the concrete piers, which are approximately 4 feet 7 inches wide. Intermediate stringers are 27-inch beams while the outer two are 30-inch beams. The sidewalks cantilever over the outside of the truss system and are supported by curved brackets attached to the exterior I-beams on girder spans and to the top chord on deck truss spans. A portion of span 7 is carried by a 12-foot 7-inch extension of the deck truss system on the west combined with I-beam stringers extended from the east. The east and west concrete approaches measure 100 feet 1 inch and 86 feet 11.5 inches, respectively, and both terminate at the bridge's abutments.

Two abutments and ten piers, all of reinforced concrete, support the bridge. Piers 4 through 6 are surrounded by water and were therefore anchored with piles. Though on land, pier 7 was anchored to account for any physical disruption to the bridge by trains passing underneath. Piers vary in length, width, and height depending on their placement under the bridge.

Ornamentation on the bridge is limited to its railings and lamp posts, which are influenced by the Art Deco style. The railing extends the length of the bridge and onto the east approach for 100 feet and the west approach for 75 feet. The height of the rail is 3 feet 10.25 inches at the posts.

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There are 14 lamp standards, 184 standard posts (Figure 3, Type A-D,H-J), and four specially designed posts (Figure 3, Type E-G) along the length of the bridge. The Art Deco motif is exhibited by the stepped design of the crowns and edges of all posts, and the matching curves of the railing and lightposts where they meet but do not intersect. Spacing between posts varies from 10 feet 1-3/4 inches to 12 feet, except when a pier or abutment is between posts, where the spacing is only 2 feet 6 inches. Lamp standards have an octagonal base with a diameter of 1 foot 5-1/4 inches. From the base, the wide standard of the lightpost tapers into the lightpole but retains the base's octagonal shape. Originally topped with ornamental bulbs, the lightposts currently display replacement lamplights with large metal tops. Standard posts are 6.5 inches square and possess 1-foot square bases. The specially designed posts were created to accommodate for a rounded corner and were also used for posts where the rail terminates (Figure 3).

Top and bottom rails are made of 3-inch x 3-inch square tubes. The center balustrade of the rail is formed by 2-inch x 1-inch horizontal metal tubes and 1-1/4-inch x 1-1/4-inch vertical metal tubes.

II. HISTORICAL BACKGROUND

The first permanent Euro-American settlers, Rodney J. Currier and Andrew Lansing who hailed from Milwaukee, arrived in Jefferson Township in December 1836. They chose the juncture of the Rock and Crawfish Rivers to locate their new settlement—the present-day Jefferson.¹

In 1842, Enoch G. Darling, one of the early settlers, and partner Gilmore Kendall built a dam across the Rock River and erected a sawmill on its east bank.² Beginning that year, a large number of German immigrants settled in Jefferson County. Early development of commerce and industry coincided with this infusion of settlers.³ Also in 1842, the first wood bridge across the Rock River was erected by the city and connected the east and west banks of the city via Milwaukee Street. By 1845, the village of Jefferson had 80 inhabitants and included a blacksmith shop, Isaac Savage's gunsmith shop, two lawyers' offices, county buildings, two doctors' offices, a schoolhouse, a sawmill, and several small stores.

Between 1845 and 1850, Jefferson saw a great influx of population, increasing from 80 residents to 550. The focus of the early community was on the two rivers. The rivers were used as power for the mills, for the shipment of goods, and for pleasure and excursion boating. By 1853, the downtown included three brick commercial blocks, two brick churches, and numerous brick residences and frame buildings.

¹ Margaret Torgerson, "Jefferson: From Village to City in 1878," <u>Daily Jefferson County Union</u>, 17 March 1978; and <u>The History of Jefferson County</u>, Wisconsin, (Chicago: Western Historical Company, 1879), 466.

² Torgerson; John Henry Ott, <u>Jefferson County, Wisconsin and Its People</u>: A Record of Settlement, <u>Organization, Progress and Achievement</u>, (Chicago: S.J. Clarke Publishing Company, 1917), 44; and <u>The History of Jefferson County, Wisconsin</u>, 466-467.

³ Centennial Celebration and Bridge Dedication, (N.p., 1936), 15.

The greatest nineteenth century population increase in Jefferson occurred between 1850 and 1860, when the population rose from 550 to 2,006.⁴ In 1856, Jefferson was chosen over Watertown as the county seat, and a year later incorporated as a village—both contributed to the community's growth. Population and business growth were further spurred by Jefferson's connection to the railroad in the late 1850s. A train of the Chicago & Northwestern Railroad Company arrived in October 1859 and began regular service between Chicago and Oshkosh in November of that same year.⁵ The railroad's completion initiated the shift of emphasis from the river to downtown for business, industry, and entertainment.

After 1860, the population influx slowed, only increasing slightly every decade.⁶ While smaller businesses such as saw and flour mills and tanneries remained important in th community, major industrial companies of early Jefferson, such as Copeland & Ryder and the Jefferson Woolen Manufacturing Company, were formed during the 1860s. By 1862, a second bridge had been erected in Jefferson. The new bridge carried First Street over the Crawfish River south of the downtown.

By 1870, there were 3,272 farms occupying 317,249 acres in Jefferson County.⁷ As farms were established in Jefferson Township in the 1860s and 1870s, the city of Jefferson became the commercial center for the surrounding agricultural community. Jefferson's first bank, the Farmers & Merchants Bank, was founded in 1873 and built on Main Street.⁸

With a population near 3,000, Jefferson was incorporated as a city in 1878, and Ira W. Bird, a lawyer in Jefferson, was elected as the city's first mayor. Due to the increased prosperity from a growing population, Jefferson's downtown expanded with many new commercial buildings constructed. By 1880, Jefferson contained ten general stores, a variety of millinery shops, drug stores, grocery stores, a bank, harnessmaker shops, blacksmith shops, law offices, physicians' offices, a bottling works, flour and feed stores, and a meat packing company. Two major industries, brewing and cigar manufacturing, were found in downtown Jefferson in the late nineteenth century. Both industries were located within the commercial district providing both employment and services to the residents of Jefferson.

⁴ Ott, 221-222, 303.

⁵ The C&NW Railroad continues to operate freight trains through Jefferson; <u>The History of Jefferson County</u>, Wisconsin, 470-471; and Ott, 223, 273.

⁶ The population peaked in 1925 at 4,000; Ott, 230, 303, 477-479; Sanborn Map Company, Fire Insurance Maps of Jefferson, Wisconsin, (New York and Chicago: Sanborn-Perris Map Co. Ltd., 1904); <u>The History of Jefferson County, Wisconsin</u>, 477-479, 482; and <u>Centennial Celebration and Bridge Dedication</u>, 21, 57-64.

⁷ Ott, 303; and "Main Street Historic District Summary Form."

⁸ The building is extant but covered by a metal screen.

⁹ Torgerson.

The History of Jefferson County, Wisconsin, 477-496.

From the 1890s through the turn of the twentieth century, many civic improvements enhanced life in Jefferson. Electricity was installed in Jefferson after 1893 and provided lighting services from sundown until midnight. License for the city water system was granted to Edward Mueller, proprietor of Jefferson House, in 1893. After 1900, the city acquired both utilities and merged them into the City Water and Electric Department. The 1890s also brought an increased awareness of the importance of bridges in the community. In 1893, a third bridge in Jefferson was erected north of the downtown to carry Washington Avenue over the Rock River. The Washington Avenue bridge was a wood bridge. The early 1890s also saw the replacement of the original wood Milwaukee Street bridge with a two-span, steel, Pratt overhead truss bridge. Other civic improvements included the first street paving in 1906 and the installation of sewers in 1908.¹¹

Near the turn of the twentieth century, commercial businesses evolved offering expanded services to the residents of Jefferson or scaling down operations to become more specialized. New services in downtown Jefferson included theaters, an American Express office, gas stations, department stores, and one-stop grocery stores. Hardware stores, furniture stores, professional offices, and a number of saloons remained as important components of the commercial center. The population of Jefferson continued to grow concurrently with industry and commercial business, bringing increased amounts of traffic through downtown. With more traffic and larger cars in the late 1920s, the Milwaukee Street Bridge, which carried Milwaukee Street and U.S. Highway 18, began to experience structural problems.¹²

III. HISTORY OF THE RACINE STREET BRIDGE¹³

In November of 1934, the Jefferson Common Council received a letter from D.J. Minahan, a project engineer with the Wisconsin State Highway Commission (SHC), announcing that a new bridge for the city was in the planning stages. The bridge was planned to extend Racine Street across the Rock River from Main Street to First Avenue, and carry the traffic that burdened the outdated and frail Milwaukee Street Bridge constructed in the early 1890s. The project was designated as U.S.P.W. Highway Project No. NRM 268-F, and construction was scheduled to begin as early as the next spring. By letter, Minahan also informed the city that the cost was estimated to be near \$100,000 but would be funded by state and federal grants. The SHC requested that the city of Jefferson supply the cleared titles to all property within the right-of-way and settle any disputes with property owners that would be neighbors

¹¹ Ott, 227.

¹² The Milwaukee Street Bridge was relegated to one-way traffic after the Racine Street Bridge was completed. In 1962, the bridge was ruled unsafe for traffic and condemned. The bridge was used briefly for pedestrian traffic only, and three years later it was demolished.

¹³ The Racine Street Bridge has been issued Wisconsin Department of Transportation identification number B-28-241. A number is given to each bridge on the state's public highway system in Wisconsin.

to the new bridge. In addition, the city would be required to provide maintenance for the structure for its lifetime.¹⁴

Planned to be a three-span deck truss with a length and height that far surpassed the Milwaukee Street Bridge, it was locally dubbed the "Super-Bridge." The Super-Bridge was planned at a new location for two reasons. The first was that no previous bridge had to be removed before construction could begin, which allowed the contractor more freedom with no remnants of a previous structure to work around. The second reason was to straighten U.S. Highway 18. The highway made four right-angle turns through Jefferson in order to cross the Milwaukee Street Bridge, but along the new route, all turns were eliminated, and highway traffic passed through only a portion of the downtown.

After deliberating for several months, the Jefferson Common Council signed a maintenance contract for the new structure in March of 1935, and with this, state authorities assured the city that the new bridge would be constructed. Funds had recently been apportioned for the bridge by Section 204 of the National Industry Recovery Act. Contracts for bridge construction were to be advertised immediately upon approval of the contract and maintenance agreement from Washington, D.C.¹⁵

The contract that came back from Washington outlined specific monetary allotments that would provide funding for the bridge. Funds were provided from the regular Federal Aid allotment to the State of Wisconsin and then matched from the State Trunk Highway allotment of license fees and gas taxes to Jefferson County. The contract regulated wages to a minimum of \$.65 an hour for skilled labor, \$.55 for intermediate labor, and \$.45 for unskilled labor. Working time was also regulated to eight-hour days and no more than 40 hours per week.¹⁶

On April 2, 1935, bids were opened for the construction of Jefferson's Super-Bridge. The bridge was to be of concrete (1,300 tons) and steel (600 tons) construction, 1,100 feet in length with a 30-foot roadway and 5-foot 6-inch sidewalks. There were many positions open for both skilled and unskilled workers. W.R. Powell, Manager of the National Reemployment Service at Fort Atkinson, suggested that any unemployed man in Jefferson County who was qualified for any of the positions should report as soon as possible.¹⁷

By April 4, only two days later, it was reported that the first contract on the bridge had been let. Oshkosh contractors, Flour Brothers & Smith were awarded the contract for the construction of the substructure, which included piers, abutments, and river excavation, to be completed by October 15,

¹⁴ The Jefferson Banner, 15 November 1934.

¹⁵ The Jefferson Banner, 7 March 1935 and 14 March 1935.

¹⁶ The Jefferson Banner, 16 January 1936.

¹⁷ The Jefferson Banner, 28 March 1935.

1935. Their bid of \$36,023.62 was the lowest of the eight contractors that submitted bids. The highest bid was about \$53,000.18

The contract for the superstructure and approaches was ready to be bid by January of 1936. Within one week after bidding opened, the contract was awarded by Commissioner John Perry to the Milwaukee Bridge Company, a major bridge contractor in the state. Their bid of \$93,419 was the lowest of six contractors, and the highest nearly \$12,000 more. Work on the Racine Street Bridge superstructure was to begin about March 1, 1936, and construction was estimated at one year.

About a month after construction began on the superstructure for the Racine Street Bridge, the Milwaukee Street Bridge buckled and was closed to traffic for several weeks during repairs. The center girder of the bridge crumpled four or five inches and clearly demonstrated the city's need for the new bridge.¹⁹ By September that same year, the Super-Bridge was nearing completion, almost six months ahead of schedule. By mid-month, plans were being formulated for a "Monster Centennial Celebration and Dedication of the Super-Bridge."²⁰ The centennial for the city of Jefferson was to be held in 1936 during the annual German celebration during October called Gemuetlichkeit Days. The city planned a grand parade that was to cross the recently completed Racine Street Bridge. Local authorities were expecting nearly 20,000 people for the event.²¹

On October 8, with the celebration only two days away, the bridge was still not completed. Completion had been delayed because the metal railings had not arrived from the manufacturer. October 10 came and although the structure was not completed, the parade route was not altered. The ceremony began at 1:00 p.m. when Centennial Queen Ruth Dickhoff cut the dedication ribbon, and the parade crossed the bridge. The official bridge dedication started at 2:30 p.m. as scheduled. Led by SHC Chair William J. O'Brien of Madison, the dedication ceremonies transferred the bridge from the hands of the SHC to the city of Jefferson. Mayor L.J. Mistele accepted the bridge on behalf of the city.²²

With the arrival and installation of the railings, the bridge was officially opened to traffic on November 12, 1936. Traffic lights installed at the intersection of Main and Racine Streets were operated for the first time in conjunction with the opening of the bridge. At this time, the Milwaukee Street bridge had again been closed to traffic.²³

¹⁸ The Jefferson Banner, 4 April 1935 and 11 April 1935; The construction of the substructure was completed without delay and no further mention of it is found in newspaper accounts.

¹⁹ The Jefferson Banner, 9 April 1936.

The Jefferson Banner, 24 September 1936.

²¹ The Jefferson Banner, 1 October 1936.

²² The Jefferson Banner, 8 October 1936.

²³ The Jefferson Banner, 12 November 1936.

Though the Racine Street Bridge was not dedicated with an official name, two sources refer to it as the Hazelwood Bridge.²⁴ John A. Hazelwood lived in Jefferson for many years, serving as county superintendent of schools for eight years, city attorney for six years, and a state Senator from the district during the 1930s. Hazelwood lived on Jefferson's west side and envisioned a bridge that would alleviate the dangerous right-angle turn associated with the Milwaukee Street Bridge yet still unify the two downtown banks. Subsequent to the bridge's construction and his terms as state senator, Hazelwood was head of the SHC.²⁵

V. THE DECK TRUSS BRIDGE IN WISCONSIN

In Wisconsin, the deck truss bridge was used for spans ranging in length from 187 feet to 2532 feet, sometimes combining as many as 15 smaller spans to connect shores. A large vertical clearance was necessary to construct a deck truss bridge and therefore was typically built for large crossings such as those for the Mississippi, Milwaukee, Wisconsin, Chippewa, Rock, and Eau Claire Rivers. The vast majority of deck truss bridges were used near large cities due to the large amount of traffic involved in crossing these rivers.

A survey conducted by Wisconsin's Historic Bridge Advisory Committee (HBAC) in 1983 identified 22 deck truss bridges in the state. In 1997, the number of deck trusses has been reduced to 14 through replacement projects. The STH 54 Bridge over the Embarrass River in the city of New London, Which was selected by the HBAC as the finest example of a deck truss in the state, has been documented to Historic American Engineering Record standards. Only three deck truss bridges in the state are located in the southern part of the state: the U.S. Highway 51 Bridge over the Rock River in the town of Fulton, Rock County; the STH 82 Bridge over the Mississippi River in the town of Freeman, Crawford County; and the Racine Street Bridge.

VI. MILWAUKEE BRIDGE COMPANY

Originally organized in 1902 as Milwaukee Steel Structural Company, the firm changed its name in 1903 to Milwaukee Bridge Company. In that year, the company received its first major contract for the design and construction of a simple trunnion bascule bridge in Milwaukee. The first officers were Christopher H. Starke, president; Conrad Trimborn, vice-president and treasurer; Max W. Nohl, Secretary; and F.W. Moore, chief engineer. The company is one of the few that remained in business for more than 20

²⁴ The two sources that cite the Hazelwood Bridge are: c. 1940 postcard of the bridge; and "Design Guidelines for Jefferson," (Madison, Wisc.: University of Wisconsin Landscape Architecture Department, c. 1983).

²⁵ Jefferson Banner, 20 June 1935.

Wright's Directory of Milwaukee for 1903 44; Articles of Incorporation of Milwaukee Steel Structural Company, 2 September 1902, and the Amendment to Articles of Incorporation, changing the firm's name to Milwaukee Bridge Company, 25 February 1903, in Volume Q 348, 601, both located at the Milwaukee County Historical Society, Milwaukee, Wisc.

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years (1903-1961) and built bridges both in Wisconsin and out of state.²⁷ Little other information is known about the origins of the company, but information about some of its original officers has been compiled from city directories.

Starting as a laborer and piledriver in 1865, Starke went on to found Conro & Starke Co., dredgers, and Starke Bros. & Co., proprietors of the Milwaukee Tugboat Line.²⁸ By 1899, Christopher Starke was president of the Milwaukee Tugboat Line and remained in that position through 1914.²⁹ In 1902, Starke helped found the Milwaukee Bridge Company and became its first president, remaining in that position until 1914.³⁰

In 1888, Conrad Trimborn and his three brothers founded Trimborn Brothers, selling building materials, wood, and coal. By 1892, Trimborn Brothers had added the manufacturing of lime and selling of cement to their business. In 1894, Conrad Trimborn joined C.H. Starke Dredge and Dock Co., and in 1902 became vice-president and treasurer of the Milwaukee Bridge Company. In 1915, he became president, serving that capacity and as secretary into the 1930s.³¹

In 1891, F.W. Moore was a draftsman with Keepers and Wynkoop, and by 1892 was a civil engineer possibly working for the Wisconsin Bridge and Iron Company. Subsequently, he then worked for Milwaukee Variety Iron Works, Milwaukee Bridge and Iron Works, and in 1899, as an engineer for J. G. Wagner Company. Moore joined Milwaukee Bridge Company in 1903, and was listed as chief engineer in 1904 and 1905. He remained with the company through 1913.³³

The Smyth Road Bridge (1928) in the Town of Lakewood in Oconto County was built by the Milwaukee Bridge Company, and is currently listed on the National Register of Historic Places.

²⁸ Milwaukee City Directory, 1865 262; 1869-1870 294; 1870-1871 270; 1871-1872 281.

²⁹ The Milwaukee Directory for 1878 469; 1882 561; Wright's Directory of Milwaukee for 1892 742, 878; 1894 963; 1899 934.

³⁰ Wright's Directory of Milwaukee for 1902 1056; 1903 1108; 1904 1168; 1905 1197; 1906 1258; 1907 1367; 1909 1426; 1911 1515; 1913 1571.

³¹ In 1961, a third generation of Trimborn was still in charge of the company. Wright's Directory of Milwaukee for 1886 748; 1888 789; 1890 929; 1893 993; 1894 1015; 1895 945; 1899 985; 1903 1171; 1927 1886; 1932 1596; 1938 792; 1950 823; 1961 1058; Wisconsin State Gazetteer and Business Directory, 1915-1916 803.

Wright's Directory of Milwaukee for 1891 623; 1892 648.

³³ Wright's Directory of Milwaukee for 1893 691; 1894 705; 1895 659; 1899 687; 1900 732; 1901 724; 1902, not listed; 1903 810; 1904 858; 1905 878, 1906 921; 1907 998; 1909 1042; 1911 1102; 1913 1141.

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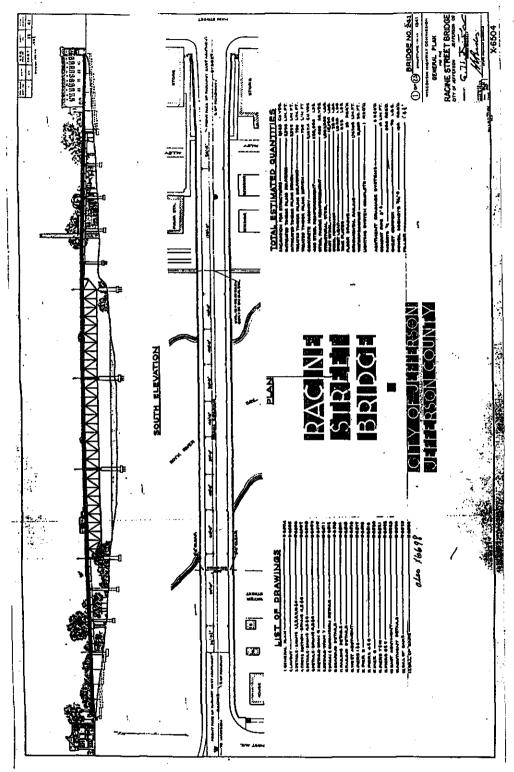


Figure 1: Wisconsin State Highway Commission, "General Plan for the Racine Street Bridge," X6054.

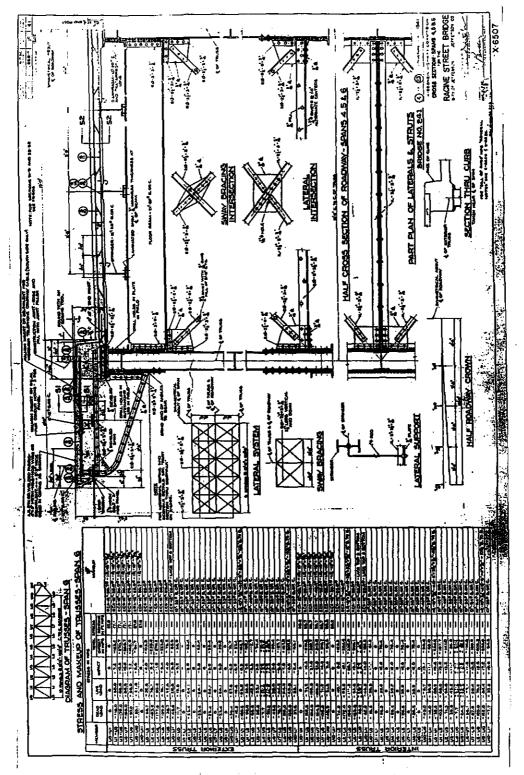


Figure 2: Wisconsin State Highway Commission, "Cross Section-Spans 4,5 & 6 for the Racine Street Bridge," X6507.

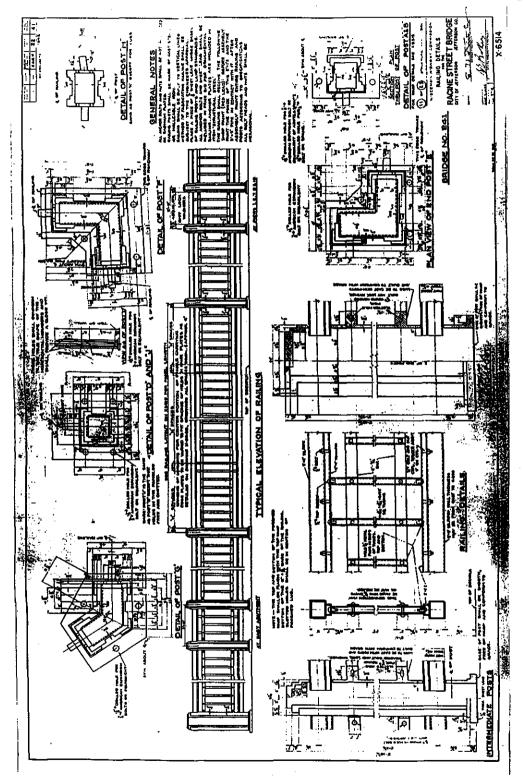


Figure 3. Wisconsin State Highway Commission, "Railing Details for the Racine Street Bridge," X6514.

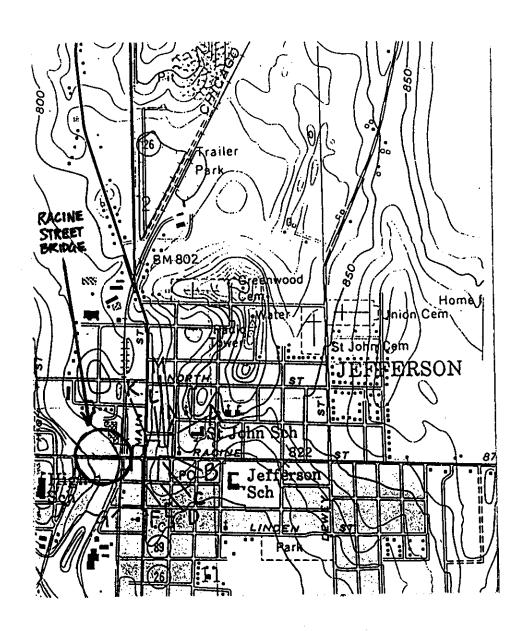


Figure 4: Location Map for the Racine Street Bridge, USGS Quad, 7.5 minute series, Jefferson, Wis.